

SBIR 2016-1
Questions and Answers #3
December 14, 2015

Q: In the NOAA 2016-1 solicitation it notes: “For purposes of this Solicitation, NOAA intends to award contracts in accordance with the Federal Acquisition Regulation.” Does that mean that the government will provide sole-source awards to HUBzone Offerors under FAR 19.13?

A: No, the government shall not be providing any sole source awards to HUBZones (or other subcategories). The Small Business Innovation Research program is open for all qualified small businesses. The legislation does not establish awards to smaller specific subcategories of small business. We do track, though, the information on these subcategories for our Congressional reports on the program’s success.

The statement that, “NOAA intends to award contracts in accordance with the Federal Acquisition Regulation...” is to avoid confusion we have received from offerors in the past. Offerors have thought these are a grant and not a contract. This is not a grant. If awarded a contract, it shall include appropriate clauses from the Federal Acquisition Regulation. Additionally, this differentiation is important to note when completing the SAM.gov registration. The process is shorter for a grant than for a Federal contract. In order to be provided an award, SAM.gov must be completed along with the necessary representations and certifications required for a Federal contract.

Q: Does the SBIR program awards contribute towards the NOAA Small Business Goals for the year?

A: Yes, they are included in our small business utilization numbers.

Q: Should the technical content (22 Pages) start on Page 3 or Page 4 of the submission? Does the cover sheet count as one or two pages? The solicitation states both.

Section 3.3.1:

Complete all items in the “Cover Page” (front and back side) required form and use as page 1 of the proposal. Ensure that required signatures are included.

Section 3.3.4:

Beginning on page 3 of the proposal, the following sections are required:

Checklist on page 106 states:

_____ 1. The COVER PAGE (Form 9.1) has been completed and is page 1 and 2 of the proposal. Required signatures are included (see Section 3.3.1)

_____ 3. The TECHNICAL CONTENT of the proposal begins on PAGE 4 and includes the items identified in SECTION 3.3.4 of the solicitation. The technical content section of the proposal is limited to 22 pages in length.

A: Please see Amendment 0001 which reflects corrections to the page numbers in sections 3.3.1, 3.3.3, 3.3.4 , and 9.7.

Q: I am looking into NOAA2016-1 Small Business Innovation Research and am a bit confused regarding PI affiliation requirements. From what I've read the RFP clearly states that the PI must be a primary employee of the SBC; however, I've been told by some other folks with experience in these types of grants that the PI could be employed by a University and partner with an SBC for the project. As a full-time employee of a university can I be the PI for a NOAA SBIC grant if the grant was submitted in partnership with a local SBC?

A: As stated in the solicitation under 1.7.9, “The primary employment of the principal investigator/project manager must be with the SBC at the time of award and during the conduct of the proposed project. Primary employment means that more than one half of the PI/PM’s time is spent in the employ of the small business concern. This precludes full-time employment with another organization (also see Section 1.5).” A full-time employee for a University cannot be the Principal Investigator. In terms of the relationship, the University would be considered a subcontractor.

You may be thinking of the Small Business Technology Transfer (STTR) program, which is a sister program to SBIR. Under STTR, small businesses are required to partner with a university and the PI may be with either the small business or the university. The SBIR program does not operate this way. Under SBIR the PI must be a full time employee of the small business who submits a proposal.

I have seen on occasion where an individual will have submitted a proposal as their own business and they have still retained some limited part time work with the University (so as to ensure that primary employment is with their new company).

As an additional side note, this will not be award as a grant. It will be awarded as a federal contract.

Q: Is NOAA awarding multiple contracts for the same research topic in this solicitation or will there only be one awardee per topic?

A: There is no clear answer at this juncture. It really depends on how many good viable proposals we get for the various subtopics and the total funding available.

Q: I am a single-member LLC that will be performing much of the work, but will likely be working with a university to perform some specific items of the early-stage prototype development. If which items are done at my company vs. the university change during the process of execution, how would that be handled, and should it be addressed as a potential variable in the application process?

A: The SBIR program requires that a minimum of two-thirds of the research and/or analytical effort must be performed by the awardee. Therefore, only one-third of the work can be subcontracted out. The University would be considered a subcontract (see footnote 1). So when planning the work, I

recommend that you carefully consider what work you can do and what you need the University to do. You'll need to be sure that you do not violate the completing the minimum of two-thirds of the work.

Q: In Section 3.1 of the solicitation, it indicates that the potential awardee is not to proceed with work until an official award is received. Does this preclude any work (including both similar work, and preparatory work necessary for the proposed content) from progressing on an at-risk basis at my own expense, or if another means to accomplish any of the technical goals presents itself before the award is announced? Or, do I need to include any work that will be done in relation to what is being proposed in the "Related Research and R&D" section?

A: If you are doing work outside of your submitted proposal, there is nothing to preclude you from continuing it (such as related R&D work). The concern is related to work that you only planned to do if you received a contract from the government (typically what is included in your proposal). Until you receive an official award document from the government, there is no guarantee that you will receive payment for work proposed or that a contract will be issued.

Q: I have not currently made any other federal grant proposals for similar work. However, if I do in the future before the SBIR grants are awarded, when and how should that be disclosed to the NOAA SBIR program?

A: By the way, this will not be a federal grant. Awards will be issued as a federal contract. If not known at the time of submission of your SBIR proposal, you should immediately notify us when you submit a proposal to another agency for essentially equivalent work or a significant amount of essentially equivalent work (to place us on notice of the possibility). If selected for a grant or contract for essentially equivalent work, you should notify us immediately of the selection. Email should be sufficient for notification. It is illegal for companies to accept multiple awards for the same or essentially equivalent work.

Q: On Subtopic 8.1.1F, the Request for Proposal is very specific about species in the "Activities" and "Expected Deliverables" sections. It refers particularly to fish species, and curiously, also red abalone. The fish species are largely 'candidate' species as well. Is the intention to limit proposals to these species?

A: Yes, that is the intent. The candidate list is intended to focus on warmer-water offshore pen culture, but they are not yet commercially viable.

Q: On Subtopic 8.1.1F, also, this section incorrectly states "the state of the art." For example, it says "Atlantic salmon is the only species to undergo extensive selective breeding." This is not true on the

world stage and also not true on the national stage as there are programs for shellfish that started in the last century, one actually before breeding was initiated in Norway.

A: You are correct that selective breeding has been going on for a long time. We chose the word “extensive” to describe modern selective breeding approaches in Atlantic salmon. We have revised the wording in the subtopic to clarify that we do not mean conventional trial and error based selective breeding approaches.

Q: On Subtopic 8.1.1F, I find this particular subtopic an odd solicitation for an SBIR, especially in the light of mentioning candidate species. SBIR policy is for ⅓ of the work to be done by awardee (for obvious and legitimate reasons). But the nature of the work requested (e.g., SNP discovery) in this subtopic is NOT the kind that can be done by either start-ups or even well ensconced industries because of its technical nature (bench work) and reliance on costly capital equipment (sequencers, to name one). It is not clear to me how anyone could respond to this RFP within the guidelines unless there were an exemption of some sort. At the very least, maybe there is a company or two that could respond, in which case, it makes the RFP sound targeted to those companies.

A: At this time, we do not believe that is the case. NOAA representatives have been approached by small businesses interested in this type of work at the US and World Aquaculture Meetings and the Plant and Animal Genome meetings.

Q: On Subtopic 8.1.2F, is there a definition for how you consider an activity to be off-shore?

A: "Offshore" means in federal (not state) waters, which in most areas means 3 miles from shore. This means offshore operations typically require specialized engineering and technology to address challenges related to deeper waters, stronger currents and storms, and greater distance from shore facilities. Projects that advance such technologies, even if the projects themselves take place in state waters or even on land, would be eligible.

Q: On Subtopic 8.1.3F for this camera system, what is the desired maximum observation depth, maximum area floor depth, and maximum water turbidity?

A: Maximum deployment depth to 500 meters; the maximum observation and maximum area floor depth are dependent on the maximum deployment depth of 500 meters.

Q: On Subtopic 8.1.3F, are there specific ocean waters that this system will be used or will it be used in any open water?

A: The system will be deployed in various ocean water conditions.

Q: On Subtopic 8.1.3F, what is the desired vertical field of view for this camera system?

A: There is a wide range of configurations utilized from 35 to 95 degree vertical view fields utilized.

Q: On Subtopic 8.1.3F, currently are fish measurements done offline or on the camera system itself? What is the most desired in this case?

A: Measurement analyses will be done off-line by other software, while the camera system requires are software for interface and synchronization.

Q: On Subtopic 8.1.3F, should this system be capable of providing images for identifying a particular type of fish and measurement or just counting and measuring any fish?

A: No, measurement analyses and image recognition will be done off-line by other software, while the camera system requires are software for interface and synchronization.

Q: On Subtopic 8.1.3F, at what range should this system be expected to measure fish length (i.e. a fish that is 1-10 meters away or 1-20 meters away)?

A: This is highly dependent on water conditions (visibility, light, turbidity).

Q: On Subtopic 8.2.1N, is full station keeping required? What accuracy is needed for station keeping?

A: Full station-keeping is required. The ROV is required have the ability to be completely still on the seafloor.

Q: On Subtopic 8.2.1N, how long should the system be expected to stay on site? Vehicle endurance expected (hrs)?

A: The system shall have the ability to stay on site for several hours and possibly up to several days. Vehicle endurance expected is several hours or even days depending on the amount of time recording vs. moving.

Q: On Subtopic 8.2.1N, can you provide specifications for the sensors and camera(s) that NOAA plans on using on the vehicle?

A: No specific sensors or cameras have been selected by manufacturer or model. The specifications at a minimum need to meet the following parameters.

High Definition 1080P video camera with sufficient control over the camera from the OCI to:

- Record/Stop
- Playback Recording (to OCI monitor)
- Delete Recording
- Camera Menu System
- Manual/Auto focus
- Iris Control
- Wide Angle / Zoom
- Camera Pan/Tilt
- Camera Positioning Arm deploy/retract

Q: On Subtopic 8.2.1N, how close does the system need to follow an organism?

A: The system needs to have the ability to get within inches of the study subject and focus in wide angle and high detail (macro videos and photos).

Q: On Subtopic 8.2.1N, what speeds would the system need to reach in order to follow the intended organisms?

A: The system is not intended to follow "fast" organisms. The subjects of study will be slow-moving or sessile organisms, or "fast" organisms studied from a distance in their habitat. The critical factor is that the speeds are low enough as to not disturb the bottom but the system can cover up to ten feet per minute.

Q: On Subtopic 8.2.1N, is the focus on underwater communication to evaluate underwater acoustics, laser communication systems or simply as a method to remove the complexities and disturbances due to support vessels in the area, while still maintaining camera and system control?

A: The focus is on "wireless" communication, to remove the complexities and disturbances due to support vessels in the area, while still maintaining camera and system control.

Q: On Subtopic 8.2.1N, does expected vehicle cost include NOAA sensors and cameras?

A: NOAA has not specified sensors for this system however the cost of a camera meeting the system requirements should be included in the expected vehicle cost.

Q: On Subtopic 8.2.1N, what currents will the vehicle be exposed to while on station?

A: 0-2 knots

Q: On Subtopic 8.2.2N, do you want the device to kill the lionfish or will herding them to a collection point be acceptable? Is there a price goal?

A: Killing lionfish is acceptable. Herding them to a collection point is acceptable, as long as a feasible collection capability can be employed. For example, herding in shallow water would allow divers with spears to cull the population. Herding in deep water would be acceptable if a retrieval mechanism could also be employed to remove them.

No price goal has been considered, but the large scale and international scope of the lionfish problem is likely to favor relatively simple control measures at low per unit costs. Should this capability result in commercial applications, the costs will need to reflect potential market conditions.

Q: On Subtopic 8.2.3D, What is the desired number of measurements as a function of depth for BOD and COD?

A: Minimum of 2 measurements per meter.

Q: On Subtopic 8.2.3D, how many profiles should the device be able to perform without needing to be retrieved?

A: Minimum of 1 profile, which includes both the downcast and the upcast.

Q: On Subtopic 8.2.3D, can you quantify "quick response" in terms of time?

A: Ideally, measurement would be obtained within several seconds; however, anything less than 1 minute will be acceptable.

Q: On Subtopic 8.2.3D, is there a cost target for this device?

A: \$10,000

Q: On Subtopic 8.2.3D, would there be a benefit to being air deployable?

A: No

Q: On Subtopic 8.2.3D, what accuracy and precision are you looking for in terms of mg/L?

A: Depending on the BOD and COD of the water sample, accuracy should be less than a few percent and precision should be less than 1 percent.

Q: On Subtopic 8.2.3D, would you accept a solution that had a disposable element to it?

A: If it's just one small component of the instrument (e.g., a membrane) and the replacement part is low cost, then yes. We are not looking for an expendable, single-use instrument.

Q: On Subtopic 8.2.4D, do you have a price target for the Sensor?

A: Price target will vary based on platform (e.g. ship or aircraft). Aircraft units will be required to be higher power and faster response which will increase their costs. Target price for ship-based solutions would initially be on the order of \$80K to \$100K and with volume reducing to under \$40K. Target price for airborne platforms would range from \$200K to \$500K depending on the platform (altitude & size/weight/power requirements), and these costs would reduce in volume.

Q: On Subtopic 8.2.4D, do you want the sensor to be identical for ship-board and airborne deployment?

A: Ship based and aircraft sensor would be very similar. The aircraft system would require higher power to overcome range loss and antennas would differ. Aircraft system would most likely use SAR processing to enhance resolution as well. But the fundamental measurement approach and operating frequencies should be the same.

Q: On Subtopic 8.2.4D, do you have a priority list for types of debris to be detected? As an example- fishing gear, fast-food packaging, etc.

A: I would equally prioritize a range and variety of debris all of which pose significant hazard and environmental impact. Large debris that threatens navigation (meter-scale or greater) is a definite priority as are largely submerged objects (with a small but persistent surface signature) such as adrift fishing nets. Smaller debris (plastics) tend to cluster, so while individually they are difficult to detect,

can exploit changes the aggregate surface properties (in terms of backscatter, surface velocity and correlation) for detection and characterization.

Q: On Subtopic 8.2.4D, is there a preferred technology for the sensor?

A: Preferred solution would be radar as it would provide large area coverage and operate over a large range of environmental conditions (not limited by cloud cover, day and night time capable, etc.). Radar also allows exploiting the surface scattering characteristics of the electromagnetic interactions in order to address a range of debris types, all of which are of high environmental and socioeconomic impact.

Q: On Subtopic 8.4.1W, does NOAA intend to use the vehicle for large-scale terrain mapping to develop pre-storm terrain imagery databases? If so, what is the intended rate of use, in terms of flight hours per week? (Ref. 8.4.1W Project Goal #2)

A: Possibly, if it is affordable and airspace becomes available. The rate of use will be determined during the transition analysis.

Q: On Subtopic 8.4.1W, please verify imagery types needed for storm damage and burn scar assessment, e.g. electro-optical/IR, or other parts of the spectrum. (Ref. 8.4.1W Project Goal #2)

A: NOAA requests recommendations for sensor/imagery types.

Q: On Subtopic 8.4.1W, please verify desired weather limitations for the platform in terms of maximum winds, maximum rate of precipitation (rain, snow), ambient temperatures, and icing conditions present in the operating environment. What is the speed in miles per hour that defines 'moderate winds' in the section pertaining to Phase I activities and deliverables? (Ref. 8.4.1W Project Goals #5 and #6, and Phase I deliverables)

A: NOAA requests that wind limits be presented for each platform for the Phase I feasibility study.

Q: On Subtopic 8.4.1W, are there preferred data sources for accessing river level information that the UAS or ground station should interface with? How this data is currently obtained at NWS facilities or other Emergency Operations Centers if other than visual verification by an individual at a known measuring location. (Ref. 8.4.1W Project Goal #3).

A: Data sources are through remote and manual sensing including visual verification.

Q: On Subtopic 8.4.1W, please provide an example of an acceptable test facility that provides calibrated weather data up to 3,000' AGL for temperature, wind and humidity in order to verify UAS sensing accuracy (Ref. 8.4.1W Deliverable #2?).

A: NOAA's Sterling Field Support Center (SFSC)

Q: On Subtopic 8.4.1W, do project test facilities for the meteorological data have to be collected outdoors or can they be completed in altitude chambers or other simulated environments that enable verification of UAS and sensor performance using different tests for temp, humidity and winds?

A: Testing may be conducted as required for transition to an operational environment.

Q: On Subtopic 8.4.1W, For the Phase I effort, can the video, sensor, and datalink capability be demonstrated on a manned surrogate aircraft, for example a helicopter, in fulfillment of deliverables or must the tests be done on some type of UAS?

A: Phase I is a feasibility study with application, sensor and platform analysis included. Testing may be conducted on manned and/or unmanned platforms.

Q: On Subtopic 8.4.1W, is NOAA specifically looking for a single solution that meets all of the listed applications (there are 10 applications listed on page 78 of the solicitation)? Another point needing further clarification is the list of expected deliverables. At the end of the Phase I period, is it expected that a UAV will be produced?

A: Phase I is a feasibility study with application, sensor and platform analysis included. UAV production is not required for Phase I, but prototyping of platform/sensor(s) may be conducted.

Q: On Subtopic 8.4.1W, can a company propose a sensor system that could be adapted to most commercially available UAV?. Would this type of proposal be responsive if a typical commercially available item were acquired for this purpose? Or should a new UAV be designed and developed along with the proposed technology?

A: NOAA recommends that COTS platforms be used if available.

Q: On Subtopic 8.4.1W, the solicitation shows that Phase 1 efforts are aimed at studying concept feasibility; however, deliverables are focused, primarily, on a performance demo. Is the cost-feasibility study as part of that? That said, is it considered responsive to propose a general platform configuration and then look to use Phase I to refine the design concept - to include various aspects of parametric studies? At this point, it seems like a number of COTS platforms can start approaching the Threshold performance levels, but much more detailed analysis and redesign/modification is needed to meet Objective performance levels - for example a vertical flight weather sampling mission with 50 - 100 stops for sample taking.

A: Phase I consists of a feasibility study. Performance demonstrations may be included in Phase I, but are not a full requirement.

Q: On Subtopic 8.4.1W, what is NOAA's definition of airworthy? This is in reference to the project deliverables.

A: FAA approval into the National Airspace.

Q: On Subtopic 8.4.1W, does total cost of ownership include the family of payloads, e.g. EO/IR camera, LIDAR, weather sensor, and siren? Can some of those items be parsed out as optional purchases to a base package, like the siren or the LIDAR?

A: Yes, please break each payload out by cost, size, weight and power.

Q: On Subtopic 8.4.1W, is the total number of units that NOAA expects to purchase on the order of 240 or 40? This is based on white paper text relating to total units needed to fulfill the NWS Decision Support Services mission.

A: Final quantity is currently unknown.

Q: On Subtopic 8.4.1W, is there a specified operational temperature range for the aircraft, e.g. -20 deg. F to 120 deg. F?

A: The military specification may be used but is not required.

Q: On Subtopic 8.4.1W relating to airworthiness statement/certification, does the Phase I prototype have to meet this requirement or is that for the Phase II final product?

A: Phase I platform maturity will reduce the risk for Phase II final product.

Q: On Subtopic 8.4.1W for flight testing, does this have to be done under NOAA's Certificate of Authorization or 333 Exemption, or can the proposer work on COAs/333s that they obtain on their own?

A: The government prefers if it is obtained by the company.

Q: On Subtopic 8.4.1W with regard to deliverables, what defines a "simulated" damage area?

A: See Amendment 0001 for clarifications under this subtopic.

Q: On Subtopic 8.4.1W, the NOAA white paper lists, under the section on Benefits of Small UAS to the NWS, the necessity of a video camera that records ground level imagery from a height up to 400 feet AGL. Is there a particular reason that 400 ft. AGL was selected? Is that based on the assumption that the FAA will allow COA or 33 exemption operation of UAS up to 400 ft. AGL or is there a specific data-related reason for this altitude?

A: Yes, it is based on UAV flight requirements under FAA COA or 333 exemption.

Q: On Subtopic 8.4.4D, the project goals calls for a "fully adaptive and re-configurable architecture". Can the architecture include adaptable radios on the satellites? Can the ground station command the satellites to adapt their waveforms in response to the current local RF environment at the receive station? Is the full communication system architecture "on the table"? Or, are the satellite radios fixed leaving the interference mitigation the full responsibility of the ground station processing?

A: The satellites downlink frequencies come from satellites that are either currently on-orbit or have completed ground testing and to be launched soon. In either case, there are is no feasible way to consider adaptive transmitters on these satellites. The offeror should focus on advanced signal processing schemes to eliminate or reduce the interference from LTE signals produced by terrestrial commercial wireless carriers to the satellite downlink signals received by 16 DOC earth stations from NOAA satellites. The satellite transmitters should be considered fixed, leaving the full responsibility of the interference mitigation to signal processing or other ground site techniques. No modifications to current or future NOAA satellites is practical and should not be considered.

Q: On Subtopic 8.4.4D, sections in the solicitation make repeated mention of a "filter" for interference cancellation. May we interpret "filter" in a very general sense to mean a system (hardware) and algorithms (software) for canceling interference? May we propose to use multiple antennas to cancel interference?

A: The term “filter” is used in a general sense to relate to any innovative hardware or software (algorithms) solutions that can potentially eliminate, or significantly reduce in real-time, the in-band interference to downlinked satellite signals from the LTE signals produced by terrestrial commercial wireless carriers . Any innovative and cost-effective solutions, including the use of, or combination of antennas, hardware or software, will be considered and evaluated.

Q: On Subtopic 8.4.4D, is there a desire to increase data rates in the downlink?

A: The currently operational and on-orbit NOAA satellite, called POES and GOES, are legacy satellite systems and the downlink data rates are fixed. The new generation of NOAA satellite systems, called JPSS and GOES-R, which will be launched in the next year, and has higher data rates than the previous generation of NOAA satellites. It is suggested that the offeror consider the flexibility and scalability of their solutions to both wider bandwidth and increased data rates.

Q: On Subtopic 8.4.4D, how important is cost for a receiver system. Is it important to make the system low cost so that civilian users can remain active in downlinking data?

A: Clearly, affordability of any solution is important. We recommend that the offeror solution focus on innovative and affordable signal processing techniques (both hardware and software) for interference elimination (or significant reduction) to Government-owned satellite terminals. This terminal antenna sizes of interest range from approximately 2 meters to 30 meters.

Q: On Subtopic 8.4.4D, a phase-I activity listed is “demonstrate the feasibility of a filter to effectively identify and separate unwanted interference from LTE ...” Can the program manager provide more insight about what is wanted for a “demonstration” here?

A: Government recognizes that a full field demonstration is not possible in phase 1 of this SBIR. However, it is expected that the offeror will provide a simulation or lab experimentation that demonstrates innovative techniques at a depth that the Government can determine the value of interference elimination and or reduction of the proposed theoretical solutions.

Q: On Subtopic 8.5.2TT and 8.5.3TT, do these two technology transfer topics have same Phase I criteria?

A: Yes, the TT topics have the same requirements as all other subtopics. The Phase I shall not exceed \$120,000.00 and six months. They shall be evaluated in accordance with the criteria in paragraph 4.3 of the Solicitation.

Q: On Subtopic 8.5.2TT and 8.5.3TT, Can the National Buoy Center participate in a proposed research project?

A: The National Buoy Center cannot be a subcontractor or consultant to a potential awardee. They also cannot be contacted during the solicitation period (see Paragraph 1.6 of the solicitation) for assistance in obtaining additional information or in obtaining advice on developing your proposal.

Once an award is made, the government may include appropriate representatives from the National Buoy Center to participate in a technical kick-off meeting and in other progress report meetings.

Q: On Subtopic 8.5.2TT, what is the price of a Smart Module? Is it currently available for purchase? Will the awardee need to plan on manufacturing this item for use and testing in a potential Phase I or II or will it be provided by NOAA? Will this item need to be returned upon the completion of Phase I (if not awarded a phase II) or Phase II? It says that we can receive a no-cost research and technology license for one year which can be renewed under Phase II? Will the license for Phase II be for two years? After completion of Phase I and/or Phase II, what opportunities exist to obtain further licenses so that we can move into a Phase III (commercialization)? Will there be a cost associated with the license? How long will it be good for?

A: The Smart Module has not been developed for outside sale, so there is not a price we can reference. NOAA can provide one set of the hardware for use by the awardee. However, we do need to note that the device is programmed (and the code specifically designed) to work for its present application on NOAA buoys. The system is coded to communicate directly with specific operational NOAA components at the National Data Buoy Center. Therefore, the device with its current code will be of limited use to the awardee without some modifications. The SBIR awardee would need to work directly with the inventor to understand the code as written and make some modifications for testing and analysis. The code set would need to be completely redesigned for new commercial applications, so this should be factored into the phase I and II activities.

The device would be conveyed to the company under a limited-term, royalty-free R&D license which would expire at the end of phase I and would be renewed for phase II, if the awardee receives the phase II award. The R&D license would expire at the end of Phase II, so the original device would need to be returned to the National Data Buoy Center.

At the end of phase II, the awardee would have the option of negotiating a full license with NOAA for the commercial sale of the new device. The license will typically have an up-front fee and a per unit percentage royalty. However, NOAA has an interest in ensuring the SBIR awardee is successful in commercializing the technology, so the fees and royalties may potentially be negotiated in such a way that the company is not assuming risk in licensing the product for Phase III commercialization. The licenses are generally structured for the lifetime of the patent and could potentially be exclusive, partially exclusive, or nonexclusive.

Q: On Subtopic 8.5.2TT, the technology that NOAA's National Data Buoy Center has developed for this is listed as patent-pending. As you may know, pending patents cannot be searched for on the US

Patent Office website. It would be useful to understand the substance of the novelty in this pending patent. Would NOAA be willing to share either at least the first claim of its pending patent—or at least some description of the nature of the novelty in this pending patent?

A: Following is the text of the first claim as it now stands. This claim is subject to change as the patent review process progresses.

“A sensor module for accumulating, processing and transmitting sensor data, comprising:
a data input for receiving sensor data from at least one instrument, and formatting the sensor data as digital sensor data,

a processor, coupled to the data input, configured to process and store the digital sensor data in memory, and packaging digital sensor data for transmission to a remote data system; and

a satellite communication modem, coupled to the processor and the internal antenna, receiving packaged digital sensor data and transmitting the packaged digital sensor data to the remote data system,

wherein the data input further including one or more of:

a first analog input configured to receive analog sensor data from at least one external sensor, a signal conditioning circuit receiving the analog sensor data and conditioning the analog sensor data, and an analog-to-digital converter, coupled to the signal conditioning circuit, configured to convert conditioned analog sensor data into digital sensor data, and

a first digital input configured to receive one or more of digital sensor data from an external sensor and user control data from a user, wherein the processor, coupled to the analog-to-digital converter and the first digital input, is configured to process and store the digital sensor data in memory, and packaging digital sensor data for transmission to a remote data system;

wherein a sensor module may be configured through one or more of user control data from the first digital input and memory of the processor, to configure a sensor module in at least one of a plurality of modes,

wherein in a first mode, where the at least one sensor module is configured as a smart module coordinator, receiving digital sensor data from at least one other sensor module, storing digital sensor data from the at least one other sensor module, packaging digital sensor data from the at least one other sensor module with position data, and transmitting packaged digital sensor data and position data to the remote data system through the satellite communication modem and internal antenna;

wherein in a second mode, where the at least one sensor module is configured as a smart end device, receiving analog sensor data from at the least one sensor, converting the analog sensor data to digital sensor data in the analog-to-digital converter, and transmitting the digital sensor data to another sensor module configured as a smart module coordinator; and

wherein in a third mode, the sensor module is configured as a stand-alone smart sensor

device, receiving analog sensor data from the at least one sensor, converting the analog sensor data to digital sensor data in the analog-to-digital converter, packaging digital sensor data from the at least one other sensor module with position data, and transmitting packaged digital sensor data and position data to the remote data system through the satellite communication modem and internal antenna.”

Q: On Subtopic 8.5.3TT, we have the same questions for this system.

A: Yes, subject to NDBC management approval. However, the DDWM requires a specific hull, mooring and shoreside processing system to produce wave products.

Q: On Subtopic 8.5.3TT, the patent filed in 2009 claims that the Digital Directional Wave Module (DDWM) “is operational on more than 18 moored buoys of the NDBC network of 105.” Is there an update on how many buoys are currently equipped with the DDWM? is there a link on a website for the public to read the real-time data?

A: There are now more than 80. Data products are available on NDBC’s website. Raw data messages are not publicly available, but we can provide examples to the awardee.

Q: On Subtopic 8.5.3TT, would it be possible to acquire a DDWM to evaluate the technology for determining improvements?

A: Yes, subject to NDBC management approval. However, the DDWM requires a specific hull, mooring and shoreside processing system to produce wave products.

Q: On Subtopic 8.5.3 TT, what company manufactures the DDWM?

A: With the exception of the firmware, NDBC builds the DDWM from Commercial Off The Shelf (COTS) components. Some mounting pieces are custom NDBC fabrication.

Q: On Subtopic 8.5.3 TT, is there a spec sheet and have there been any improvements since 2009?

A: Yes, some information is contained in an Operators manual which was written for NDBC technician use (document # NDBC-7048). The DDWM also meets wave accuracy specifications found on NDBC's website.

Q: On Subtopic 8.5.3 TT, how does it competitively compare (features and price) with the TRIAYS Directional Wave Buoy and the Watchkeeper Directional Wave-Metocean Buoy?

A: We are not familiar enough with those other technologies to comment.

Q: On Subtopic 8.5.2TT, do you demand that the proposing organization have products similar to the smart module?

A: No, not at all. However, in order to be successful, the company should be able to show an understanding of the potential value for a final product and be able to demonstrate a capability to bring the product to the desired market. In fact, the field of use for the proposed deliverable may be completely different than the field of use for which it was designed, or there might be multiple variations that could cross market sectors. Creativity and innovation are highly encouraged.

Q: On Subtopic 8.5.2TT, is any application of the smart module acceptable?

A: Yes and alternative applications are highly encouraged. However, the company should be able to show an understanding of the potential value for a final product and be able to demonstrate a capability to bring the product to the desired market.

Q: On Subtopic 8.5.2TT, do you have a goal for probable market size?

A: No. We are relying on the industry expertise of the applicants to determine if there is a market that is sufficiently broad to undertake the development, manufacturing, and sales of the product. The proposal must be commercially viable.

Q: On Subtopic 8.5.3.TT, will NOAA entertain proposals to adapt the current algorithms (suitable only for axisymmetric buoys) to non-axisymmetric buoys or non-axisymmetric floating platforms? Does NOAA foresee any insurmountable fundamental problem with this approach?

A: Yes. Any and all modifications to the existing algorithms are acceptable. Creativity and innovation are highly encouraged for the SBIR-TT topics. To be clear, there should be an external (non-NOAA) market for the final product that is sufficient to support ongoing commercial sales. NOAA is not seeking a product for its own use from this topic.

Q: On Subtopic 8.5.3TT, what is the level of NOAA involvement that we can expect during the performance of the work (e.g. consulting time with the NOAA experts who developed the system,

pointers to pertinent literature and copies of manuals, and/or details of algorithms and copy of code implementing those algorithms)?

A: The NOAA PI has agreed to actively work with the awardee to consult on the system, existing configurations, providing literature and specifications, etc. However, the inventor's available time may vary depending upon workload, so we cannot provide an estimate of hours.

In order to ensure fair competition, all communication must be routed through the CO to ensure all potential offerors receive the same information.